Challenges and Opportunities of STEAM-based Learning in Pancasila Education: A Case Study at SDN 1 Bunulrejo Malang

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Abstract: *Pancasila Education is an important subject in elementary school. Some previous research shows that Pancasila Education learning in elementary schools is less attractive to students. One of the innovative approaches that is relevant to be used in learning Pancasila Education is STEAM. This study aims to explore the planning, implementation, evaluation, and factors influencing the implementation of STEAM-based Pancasila Education learning. This case study was conducted at SDN 1 Bunulrejo, Malang—one of the primary schools that prioritizes technology-based learning and STEAM implementation. Data were collected using semi-structured interviews, non-participant observation, and document analysis. Data analysis used thematic analysis. The findings show that integrating STEAM in Pancasila Education contributes to holistic learner character building and makes learning more effective and efficient.*

Keywords: *elementary school; pancasila education; STEAM*

Abstrak: Mata pelajaran Pendidikan Pancasila merupakan salah satu mata pelajaran penting di sekolah dasar. Beberapa penelitian terdahulu menunjukkan bahwa pembelajaran Pendidikan Pancasila di sekolah dasar kurang diminati siswa. Salah satu inovasi pendekatan yang relevan untuk digunakan dalam pembelajaran Pendidikan Pancasila adalah STEAM. Penelitian ini bertujuan untuk mengeksplorasi perencanaan, penerapan, evaluasi, dan faktor-faktor yang mempengaruhi implementasi pembelajaran Pendidikan Pancasila berbasis STEAM. Studi kasus ini dilaksanakan di SDN 1 Bunulrejo, Malang. Salah satu sekolah dasar yang memprioritaskan pembelajaran berbasis teknologi dan penerapan STEAM. Data dikumpulkan menggunakan wawancara semi-terstruktur, observasi non-partisipan, dan analisis dokumen. Analisis data menggunakan analisis tematik. Temuan menunjukkan bahwa integrasi STEAM dalam Pendidikan Pancasila berkontribusi pada pembentukan karakter peserta didik secara holistik dan menjadikan proses pembelajaran lebih efektif dan efisien.

Kata kunci: pendidikan Pancasila; sekolah dasar; STEAM

INTRODUCTION

The subject of Pancasila Education is one of the important subjects in elementary schools. This subject aims to teach students about the state ideology (Mukaromah et al., 2022; Sugito et al., 2021). A good understanding of state ideology can support the formation of good, democratic, and responsible citizens (Orlowski, 2018). This is to the objectives of national education as stated in Law Number 20 of 2003 concerning the National Education System (Sumantri & Syaefudin Sa'ud, 2021). However, there is a big challenge for Pancasila Education, namely the students' low interest and learning outcomes.

Several previous studies have shown that Pancasila Education learning in elementary schools is less attractive to students. Research conducted by Aditiya et al. shows the low motivation of students in learning Pancasila education; this can be seen in the lack of enthusiasm and activeness of students in participating in learning it has an impact on the interpretation of the material received (Aditiya et al., 2024). The lack of understanding of the values of Pancasila has an impact on the moral quality of students (Panjaitan, 2024). In addition, low motivation is the cause of low student learning outcomes (Alhadi & Saputra, 2017).

The results of these studies indicate the urgency of Pancasila Education learning innovations that aim to improve the quality of education and foster an inspiring environment, ultimately promoting citizenship values and encouraging student involvement in understanding their rights and obligations (Titin Sunaryati et al., 2022).

One of the innovative approaches that is relevant to be used in learning Pancasila Education is STEAM. STEAM is an evolution of the STEM (Science, Technology, Engineering, and Mathematics) approach with adding art elements. Adding art to learning encourages students to think creatively and innovatively and helps them express ideas more interestingly and effectively. By integrating various disciplines, students can see the connections between different concepts and apply them in a broader context (Hidayah et al., 2023).

In its implementation, the STEAM approach promotes interdisciplinary learning by integrating several disciplines to foster a holistic understanding of learning topics (Paiva-Sánchez et al., 2024), thus fostering important 21st-century skills such as creativity, critical thinking, and collaboration for students (Sousa, 2024). Implementing the STEAM approach in the learning process encourages students to relate their learning material to practical contexts and everyday life. This contributes to a deeper understanding and improved knowledge retention.

Pancasila education is known as character education which seeks to foster behavior or attitudes in learners that are by the values of Pancasila. Pancasila is a concretization of the values of divinity, humanity, unity, populism, and justice that students must implement in their daily lives (Pratiwi, 2021) so that in the learning process, the right learning method is needed to optimize the character-building of students. The expected learning outcomes are that students will not only be able to master the theory but can also become a young generation who is aware and cares about the surrounding environment and can contribute their learning outcomes to find solutions to problems. Previous research in line with this research conducted by Anik Nawati et al. (2024) stated that the creative thinking ability of students could be improved through the application of STEAM-based PjBL in Pancasila education subjects with data collection techniques in the form of test instruments. In the study, applying learning with the STEAM-based PjBL model can encourage students to think more broadly about the problems around them (Nawati et al., 2024).

Based on this background, this study aims to explore applying Pancasila education learning using a project-based learning model with STEAM basic principles at the elementary school level. Learners are expected to better understand the broad concepts of Pancasila education through the work process in a real context, so that later learners can develop positive character and be applied in everyday life.

METHOD

This case study was conducted at SDN Bunulrejo 01 Malang City. This research focuses on exploring how the STEAM approach is implemented in learning Pancasila Education. The consideration for choosing this location is the results of preliminary studies that researchers conducted found that learning in this school is oriented towards digitalization and applying the STEAM approach. This study involved one homeroom teacher, one education staff, and 20 Class IV students. These participants are determined because Pancasila Education Learning in Class IV has implemented the STEAM approach.

Data was collected using semi-structured interviews, non-participant observation, and document analysis. The research instrument was developed to answer the following research questions: (1) how is the planning of Pancasila Education learning with the STEAM approach? (2) how is the implementation of Pancasila Education learning with the STEAM approach? (3)

how is the evaluation of Pancasila Education learning with the STEAM approach? Moreover, (4) what are the supporting and inhibiting factors of Pancasila Education learning with the STEAM approach?

The data in this study were analyzed using thematic analysis techniques that adopted the Miles, Huberman, and Saldana (2014) model. The stages of analysis include data collection, condensation, data presentation, and conclusion drawing. To test the credibility of the data, researchers used two triangulations, namely source triangulation and method triangulation.

RESULT AND DISCUSSION

3.1 The implementation of STEAM-based learning in Pancasila education at SDN Bunulrejo 01 Malang

STEAM-based learning has been implemented by the fourth-grade teacher of Bunulrejo 01 Elementary School in Malang City on Pancasila Education with the theme "Religious Diversity in Indonesia." This learning uses the STEAM approach and Project Based Learning (PJBL) learning model with discussion, question and answer, presentation, and collaboration methods.

This learning activity integrates various disciplines, including Science, Art, and Mathematics, through a project to create a concept map about religious diversity. Learners are invited to collaborate in groups, exploring information about places of worship, holy books, and religious holidays. Through this activity, students learn about religious diversity and develop critical thinking skills, creativity, and the ability to work together.

3.2 The Planning of STEAM-based learning in Pancasila education at SDN Bunulrejo 01 Malang

Planning for the implementation of Pancasila education subjects through the STEAM approach has been carried out effectively by grade IV teachers at SDN Bunulrejo 1. The results of interviews and document analysis of teaching modules prepared by fourth-grade teachers show several important points.

The teacher's first stage in lesson planning is to determine the material or theme to be taught using the STEAM approach. This is important because not all materials can be taught through this method. In this context, students will study various recognized religions in Indonesia as the main theme.

The next stage is the preparation of teaching modules. According to the results of interviews with grade IV teachers, the preparation of teaching modules aims to facilitate students in exploring and experimenting and stimulate students to discuss interactively, critically, and inclusively any differences in everyday life. In addition, with a good module, educators can develop lesson plans aligned with the learning objectives set, as well as achieve Learning Outcomes (CP) and the Pancasila Learner Profile (Rismawanda & Mustika, 2024). The following is a STEAM-based teaching module on the material of Religious Diversity in Indonesia for grade IV Pancasila Education subjects at SDN Bunulrejo 01 Malang City:

Figure 1. Teaching modules of STEAM-based learning in Pancasila education

In this context, students will learn the Pancasila Learner Profile, which includes aspects of Critical Reasoning, Creative, and Mutual Cooperation on the material of religious diversity. Applying the 3 Pancasila learner profiles is relevant to the STEAM-based learning approach (Science, Technology, Engineering, Arts, and Mathematics). In the context of STEAM, Critical Reasoning skills are very important because students are invited to analyze complex problems and evaluate data objectively (Ellianawati et al., 2025). STEAM projects often require students to ask questions, formulate hypotheses, and find solutions, thus training them to think critically (Wised & Inthanon, 2024).

The Creative aspect of the Pancasila Learner Profile aligns with the Art element of STEAM, where students are encouraged to think out of the box and produce innovative work (Putri et al., 2023). STEAM learning allows students to express their ideas through various forms, be it through design, experimentation, or presentation, so their creativity can develop optimally.

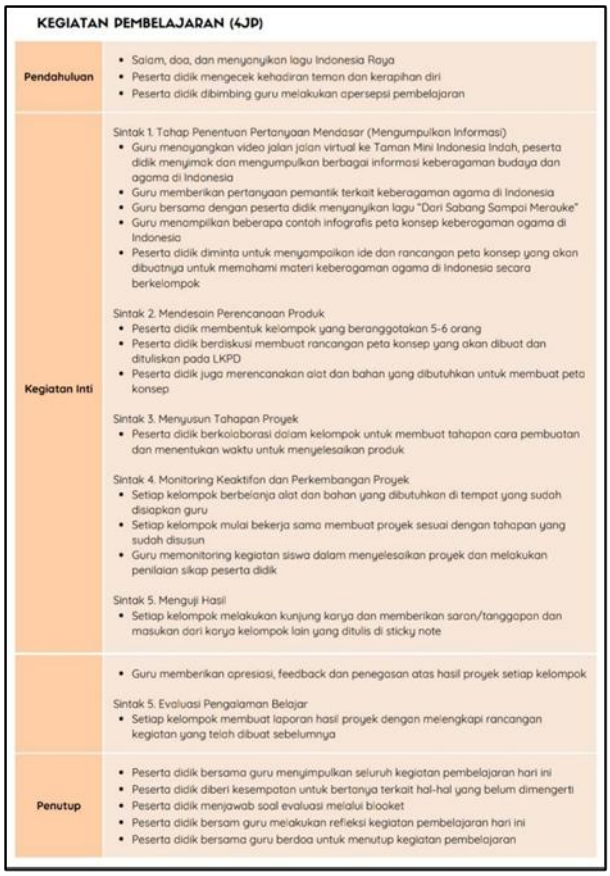
Meanwhile, the value of working together strongly supports collaboration, which is at the core of the STEAM approach. In group projects, students learn to work together, respect each other, and share responsibility for achieving a common goal. By integrating these three aspects in STEAM learning, it is expected that students will not only master the subject matter but also build strong character and integrity and be ready to face future challenges by national education goals. This approach creates a holistic learning environment oriented towards character development and relevant skills for life in the modern era.

With these steps in lesson planning, it is expected that students not only understand the diversity of religions in Indonesia but also internalize the values of Pancasila, which become the basis of their daily lives. Through the STEAM approach integrated with character education, students will learn to think critically, innovate, and work together to apply these values in social

interactions and decision-making. With a deep understanding of diversity and Pancasila values, students are expected to become tolerant, ethical individuals who can contribute positively to society, creating a harmonious and equitable environment.

3.3 Implementation of STEAM-based learning in Pancasila education at SD Bunulrejo 01 Malang

The implementation of learning with the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach in Pancasila Education subjects at SD Bunulrejo 01 Malang City is an important example of the integration of various disciplines for the development of students' character and knowledge. STEAM combines five elements that work together to provide a comprehensive learning experience. The "Religious Diversity" module is carefully designed to convey knowledge about religious diversity in Indonesia and develop critical, creative, and collaborative thinking skills among learners. Each STEAM component contributes significantly and complements each other in this learning process.



KEGIATAN PEMBELAJARAN (4JP)

Pendahuluan	• Salam, doa, dan menyanyikan lagu Indonesia Raya • Peserta didik mengecek kehadiran teman dan kerapihan diri • Peserta didik dibimbing guru melakukan apersepsi pembelajaran
Kegiatan Inti	Sintak 1. Tahap Penentuan Pertanyaan Mendasar (Mengumpulkan Informasi) • Guru menayangkan video jalan jalan virtual ke Taman Mini Indonesia Indah, peserta didik menyimak dan mengumpulkan berbagai informasi keberagaman budaya dan agama di Indonesia • Guru memberikan pertanyaan pemantik terkait keberagaman agama di Indonesia • Guru bersama dengan peserta didik menyanyikan lagu "Dari Sabang Sampai Merauke" • Guru menampilkan beberapa contoh infografis peta konsep keberagaman agama di Indonesia • Peserta didik diminta untuk menyampaikan ide dan rancangan peta konsep yang akan dibuatnya untuk memahami materi keberagaman agama di Indonesia secara berkelompok Sintak 2. Mendesain Perencanaan Produk • Peserta didik membentuk kelompok yang beranggotakan 5-6 orang • Peserta didik berdiskusi membuat rancangan peta konsep yang akan dibuat dan dituliskan pada LKPD • Peserta didik juga merencanakan alat dan bahan yang dibutuhkan untuk membuat peta konsep Sintak 3. Menyusun Tahapan Proyek • Peserta didik berkolaborasi dalam kelompok untuk membuat tahapan cara pembuatan dan menentukan waktu untuk menyelesaikan produk Sintak 4. Monitoring Keaktifan dan Perkembangan Proyek • Setiap kelompok berbelanja alat dan bahan yang dibutuhkan di tempat yang sudah disiapkan guru • Setiap kelompok mulai bekerja sama membuat proyek sesuai dengan tahapan yang sudah disusun • Guru memonitoring kegiatan siswa dalam menyelesaikan proyek dan melakukan penilaian sikap peserta didik Sintak 5. Menguji Hasil • Setiap kelompok melakukan kunjung karya dan memberikan saran/tanggapan dan masukan dari karya kelompok lain yang ditulis di sticky note
	• Guru memberikan apresiasi, feedback dan penegasan atas hasil proyek setiap kelompok Sintak 5. Evaluasi Pengalaman Belajar • Setiap kelompok membuat laporan hasil proyek dengan melengkapi rancangan kegiatan yang telah dibuat sebelumnya
Penutup	• Peserta didik bersama guru menyimpulkan seluruh kegiatan pembelajaran hari ini • Peserta didik diberi kesempatan untuk bertanya terkait hal-hal yang belum dimengerti • Peserta didik menjawab soal evaluasi melalui blooket • Peserta didik bersam guru melakukan refleksi kegiatan pembelajaran hari ini • Peserta didik bersama guru berdoa untuk menutup kegiatan pembelajaran

Figure 2. STEAM-based learning activities in Pancasila education at SDN Bunulrejo 01 Malang

The Science element in this learning is reflected through the exploration of knowledge about the diverse religions and cultures in Indonesia. Science is a system of knowledge obtained through observation, experimentation, and analysis (Idris et al., 2022). Students are invited to understand basic concepts related to religious diversity, including history and religious practices. Using a virtual video featuring Taman Mini Indonesia Indah, learners get visual information and engage in discussions that stimulate critical and analytical thinking. After the video playback, the interaction allows students to ask questions and seek answers, thus encouraging their curiosity (Sulfemi, 2020).

Technology aspects are seen in the application of digital media and modern learning tools that enhance the learning experience (Hariyono, 2023). Technology is defined as applying scientific knowledge for practical purposes in everyday life (Lubis, 2024). Students are allowed to use digital tools to construct concept maps on religious diversity, which expands their knowledge and equips them with relevant technological skills in the digital era.

In addition, an interview with the fourth-grade teacher of SDN Bunulrejo revealed that learning Pancasila Education requires additional media support in addition to the package book and LKS. This is due to the wide scope of material in Pancasila Education and the lack of examples in printed teaching materials, which often makes it difficult for students to understand the essence of the material. Therefore, the development of technology-based learning media is very important.

The use of technology-based learning media shows a significant impact on student learning outcomes (Nurfadhillah et al., 2021). This media is important in supporting student progress to achieve educational goals (Bunari et al., 2024). According to the grade IV teacher at SDN Bunulrejo 1, learning that utilizes media, especially technology-based ones, can provide more meaning for students. Examples of technology-based learning media include educational apps, interactive videos, and online platforms, which are often new to students. The introduction of these technologies can increase students' curiosity and interest. Thus, students become more motivated and focused in following the learning process, which contributes to achieving learning objectives and optimizing learning outcomes. Technology-based learning media can also increase effectiveness and efficiency in the teaching and learning process, making it an invaluable tool in modern education.

In Engineering, group project planning activities become an effective means for students to apply the theories they have learned. Engineering is a discipline that focuses on designing and implementing technical solutions to meet human needs (Davidi et al., 2021). Students worked in small groups to create a concept map reflecting information about religious diversity, which taught them the importance of planning and collaboration. This process also hones problem-solving and time management skills and develops the technical skills required to complete the project.

The Arts element is integrated through students' creativity in designing the concept map and work presentation. Arts refer to the expression of human creativity and imagination in various forms. This activity allows students to express their ideas artistically, visually, and verbally (Eva et al., 2021). Project presentations serve as an evaluation and a means to improve communication skills and public speaking ability and help students appreciate the diversity of perspectives in conveying information.

Finally, the Mathematics element plays a role in organizing and analyzing the data collected during the learning process. Mathematics studies numbers, structure, space, and change (Dharmendra Kumar Yadav, 2017). Students are trained to classify and categorize information based on religion and places of worship, which is important for building logic and critical thinking. Using math to determine the time and calculate the materials needed in making the concept map also provides a practical understanding of the application of numbers and data in everyday life.

Integrating the STEAM approach in Pancasila Education learning at SD Bunulrejo 01 Malang City creates an innovative and dynamic learning environment. By combining various disciplines, students gain knowledge about religious diversity and develop the collaborative and critical thinking skills needed to face future challenges. This approach demonstrates how STEAM can enrich learning experiences and reinforce Pancasila values in an inclusive educational context.

3.4 The evaluation of learning based on the STEAM-based in Pancasila education at SDN Bunulrejo 01 Malang

STEAM-based learning material "Religious Diversity" at SDN Bunulrejo 1 is evaluated through several integrated methods to assess students' understanding and skills. First, teacher observation uses an observation sheet to assess students' activeness and engagement during learning activities, such as listening to videos and discussing. This helps teachers understand how students interact and collaborate in groups.

Next, self-assessment and peer assessment are conducted using questionnaire sheets, which allow students to reflect on their understanding and provide feedback to classmates. Assigned tasks, such as creating concept maps, also became an important evaluation tool where students could demonstrate their understanding of religious diversity in Indonesia.

Finally, the evaluation was done through the project report prepared by each group. Students are asked to document their work's process and results, including the plan, tools, materials used, and experiences during the project. Reflection activities at the end of learning are also an important part of the evaluation, where students can express their understanding and learning experience. With this approach, the evaluation is expected to develop students' positive character and a deep understanding of religious diversity.

3.5 Factors affecting the implementation of STEAM-based learning in Pancasila education at SDN Bunulrejo 01 Malang

STEAM-based Pancasila education learning at SDN Bunulrejo 1 has various significant supporting factors. One of the main factors is the support of well-trained and experienced teachers. Teachers have a vital role in providing effective guidance, especially in explaining complex concepts of diversity. Interactive learning methods, such as Project Based Learning (PjBL), also contribute greatly to student engagement. In this way, students learn from books and through hands-on experiences, group discussions, and creative explorations that make the material easier to understand and accept.

In addition, the diversity of learning resources is an important supporting factor in this learning. According to the observation, the availability of devices that support technology-based learning at SDN Bunulrejo 1 is very adequate. One Liquid Crystal Display (LCD) projector per class and 84 Android tablets can be utilized in learning. Using media such as videos, infographics, and virtual visits to historical places provides a new dimension to learning. These resources enrich students' learning experience and help them link theory with real-world practice.

In line with this opinion, according to the results of interviews with several grade IV students, they are happier when there are new things they see or try, one of which is when utilizing technology during learning. According to the results of interviews with grade IV homeroom teachers at SDN Bunulrejo 1, grade IV students have diverse characteristics. Some students have a high learning spirit in learning Pancasila education, but some students are still lacking enthusiasm in learning Pancasila Education. Some students sometimes feel bored and lazy with learning using printed teaching materials only, different when learning using videos or other teaching materials where they are excited and have high curiosity.

CONCLUSION

Pancasila education is a knowledge concept with a fairly broad scope of material. STEAM is an interdisciplinary learning approach that links several scientific disciplines to create a holistic understanding of the learning topics studied. The linkage of STEAM learning principles and Pancasila education becomes a solid and harmonious relationship in holistically shaping students' character. The application of STEAM-based learning in Pancasila education subjects

at SDN Bunulrejo 01 Malang City is proven to develop critical thinking skills, creativity, and the ability to work together with students. The ability to collaborate is the core of the STEAM approach, where students will learn to respect each other, take responsibility, and cooperate to achieve goals. The addition of art elements in STEAM learning principles encourages learners to produce creative and innovative works. The technology available at SDN Bunulrejo 01 Malang City supports the learning process which can increase the learning motivation and curiosity of students in participating in the learning process so that learning activities become more effective and efficient.

The application of project learning based on STEAM principles in Pancasila education subjects has a significant effect on the skills of students at the elementary school level. However, this study has several factors that hinder the application of STEAM principle-based project learning in Pancasila education subjects. Namely, several teachers at SDN Bunulrejo 01 Malang City do not understand the basic concepts of STEAM to be applied to Pancasila education subjects. The diverse material of Pancasila education is also an important factor to consider in choosing the right learning model. Researchers suggest that educators can apply learning models with STEAM principles to help achieve learning goals and national education goals. Educators can implement these learning activities while still paying attention to the needs of schools and the abilities of each learner. Future research can examine the application of other variations of learning models tailored to the needs and conditions that exist and still use STEAM principles so that studies on this topic will be more extensive and complete later.

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